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THE DEVELOPMENT OF ACHIEVEMENT MEASURES FOR TRADE AND TECHNICAL EDUCATION. PROGRESS REPORT NUMBER ONE.

BY- BALDWIN, THOMAS S.
NORTH CAROLINA UNIV., RALEIGH, N.C. STATE UNIV.

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PRELIMINARY WORK ON DEVELOPING THE CONCEPTUAL FRAMEWORK INTO WHICH PSYCHOMOTOR BEHAVIORS CAN BE CATEGORIZED INVOLVED DESIGNING STUDIES TO DISCOVER THE DIMENSIONALITY OF THE TACTILE-KINESTHETIC SENSE MODALITIES IN ORDER THAT THEIR MODIFICATIONS AS A FUNCTION OF TRAINING CAN BE STUDIED. THE IMPORTANT CHANGES THAT OCCUR IN ACQUIRING THE SKILLS BEING STUDIED HAVE TO DO WITH THE PROBLEM OF TACTILE-KINESTHETIC PERCEPTION. THE SEVEN CURRICULUM AREAS WITH WHICH THE PROJECT IS CONCERNED ARE BEING ANALYZED BY A PSYCHOLOGIST, AN INDUSTRIAL EDUCATION SPECIALIST, AND SUBJECT MATTER EXPERTS SO THAT THE COGNITIVE AND PSYCHOMOTOR BEHAVIORS THAT ARE INTENDED TO BE TAUGHT CAN BE SPECIFIED IN BEHAVIORAL TERMS. THIRTEEN NORTH CAROLINA TECHNICAL INSTITUTES AND COMMUNITY COLLEGES HAVE TENTATIVELY BEEN SELECTED FOR PARTICIPATION IN THE PROJECT. ALL FULL-TIME POSITIONS ON THE PROJECT HAVE BEEN FILLED, AND FIVE CONSULTANTS HAVE BEEN CONTACTED AND HAVE AGREED TO SERVE. OTHER PROGRESS REPORTS ARE VT 003 205, VT 003 315, VT 003 699, AND VT 005 200. (HC)

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PROGRESS REPORT
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THE DEVELOPMENT OF ACHIEVEMENT MEASURES FOR TRADE AND TECHNICAL EDUCATION

Thomas S. Baldwin

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SUMMARY OF PROGRESS REPORT

Initial effort on the project involved preliminary work on the development of the conceptual framework into which the behaviors to be measured could be categorized. Important changes that occur in acquiring the skills that are being studied in this program have to do with the problem of tactile-kinesthetic perception. Work is being done on discovering more adequate ways of measuring and describing the tactile-kinesthetic sense modalities which we feel is the important dimension in the psychomotor component of the job. Preliminary studies are being designed to discover the dimensionality of the tactile-kinesthetic sense modalities in order that their modifications as a function of training can be studied.

The second major work on the project has to do with the analysis of the seven curricula with which the problem is concerned. An attempt is being made to analyze these curricula so that the cognitive and psychomotor behaviors that are intended to be taught can be specified in behavioral terms. Only a preliminary analysis of these curriculum materials has been made but detailed analyses will be conducted over the next six to nine months. These analyses will be conducted by a team which includes a psychologist, an industrial education specialist, and subject matter experts.

Institutions within which the research will be conducted have been tentatively selected and presidents of these institutions have been contacted requesting their participation in the research project. Results to date from these presidents has been quite favorable.

All full time positions on the project have been filled and a panel of five consultants have been contacted and have agreed to serve in a consulting capacity on the project.

I. General

The initial phase of the project was devoted to meetings to orient the project staff to the area in which we would be working and to discuss special problems which might arise. To familiarize the staff with the North Carolina Department of Community Colleges and to orient institution presidents to the purpose of the research, trips were made to a number of institutions within the state. These trips took the form of a general orientation as well as interviews with institution administrators and individual instructors in our proposed areas of study. The cooperation afforded was extraordinarily good. This is of prime importance if the project is to be successful.

Meetings were also held with the members of the North Carolina Curriculum Laboratory, whose responsibility it is to develop and periodically revise the curriculum materials used in the North Carolina Department of Community Colleges. These meetings were useful in establishing liaison with this organization and in providing insight into their method of curriculum development.

II. Development of a Conceptual Framework for Psychomotor Behaviors

A major initial effort has been to develop a conceptual framework in which to operate. To help accomplish this a literature search was initiated, but proved to be rather discouraging. Very little previous work had been done in the psychomotor achievement area, while much work had been done in the aptitude area.

After discussing this situation at length we felt that there had to be a link between the aptitude and achievement ends. This link we felt existed in the belief that the psychomotor <u>responses</u> measured before training

(aptitude) were quite similar to those measured at the end of training (achievement). The change from unskilled to skilled was, then, accomplished primarily by a rearrangement and integration of different memory feedback systems. Since we were working in the area of psychomotor skills we felt that the development of the kinesthetic sense was of utmost importance.

Discussions were held with psychologists and master tradesmen about the term "feel" one often encounters in discussing any given skill. What is meant by the word feel, and why is it so many people say that it cannot be taught? Although we have not yet investigated this question it is our belief that "feel" refers to and is a product of the rearrangement of tactile-kinesthetic memory feedback to a very fine degree. In fact, to such a degree as to make it well nigh impossible for it to be verbalized. This emphasis on perceptual rearrangement in skill development has been reinforced in discussion with people in the military as well as with people in psychology and education.

The initial problem in pursuing useful research on psychomotor skills is to develop methods by which we can measure the tactile-kinesthetic sensitivity of people in various situations. At present no adequate means of doing this exists. There is a good possibility that this can be accomplished, with the use of proper apparatus, by conventional experimental and correlational methods. Plans for the next few months call for the design and conduct of experiments to help in describing and measuring this quality of "feel," or tactile-kinesthetic feedback.

III. Curriculum Analysis

Curriculum outlines developed by the Curriculum Laboratory, Department of Community Colleges, and approved by the State Board of Education for offering in Technical Institutes and Community Colleges have been secured for

each curriculum pertinent to the research project. Courses in each of these curricula have been analyzed and grouped into three general categories. These general categories are, (a) courses directly involving the trade or technology, (b) courses which are related to and support the technology, e.g., mathematics, physics, blueprint reading, and (c) courses of general instruction, e.g., English, human relations, economics.

Discussion is currently underway to determine how each of these different areas of instruction shall be treated in the research project. Enrollment data for the entire North Carolina Department of Community Colleges have been obtained. From these data, actual enrollment, by institution, in each curriculum pertinent to the research project has been determined.

The data referred to above have been analyzed, and thirteen technical institutes and community colleges have tentatively been selected for participation in the research project. These institutions were selected on the basis of (a) enrollment in a given curriculum, (b) length of time in operation, and (c) geographical location. Letters have been written to the presidents of each of the thirteen tentatively selected institutions explaining the research project and asking the participation of their respective institution in the project.

The analysis of curriculum materials will be continued in depth during the next six to nine months of the project.

IV. Personnel

The following personnel were added to the project staff:

Mr. Robert Markman, full time Research Instructor, A.B. in Psychology from Brooklyn College, Brooklyn, New York; and M.A. in Psychology from North Carolina State University.

Mr. Charles F. Ward, full time Research Instructor, B.S. in General Math from University of Georgia, Athens, Georgia; and M.E. in Industrial Education from North Carolina State University.

Dr. J. Clyde Johnson, EdD in Educational Psychology from George Peabody College for Teachers, Nashville, Tennessee, and Associate Professor of Psychology at North Carolina State University. Dr. Johnson will work on this project full time during the summer months and half time during the academic year.

Mr. Chris Ching Yang Hsu, Research Assistant, B.S. in Psychology from National Taiwan University, Taipei, Taiwan; and M.Sc. in Industrial Psychology from North Carolina State University. Mr. Hsu will work on the project for the months of June-August only.

The positions of secretary, laboratory technician, and most of the graduate assistant positions have been filled.

V. Consultants

The following individuals have been contacted and have agreed to serve as consultants on the project:

Dr. Rupert N. Evans, Dean, College of Education, University of Illinois.

Dr. Herbert A. Toops, Professor Emeritus, The Ohio State University.

Dr. Robert J. Wherry, Professor and Chairman of Department of Psychology, The Ohio State University.

Dr. Edwin A. Fleishman, American Institute for Research, Washington, D. C.

Dr. Robert F. Lockman, American Psychiatric Association, Washington, D. C.